What is claimed is:

1. A method of producing a semiconductor integrated circuit device comprising the steps of:

(a) forming a first conductive film over a semiconductor substrate and then forming a first insulating film over the first conductive film;

(b) forming a plurality of gate electrodes and a cap insulating film covering an upper part of the gate electrodes by etching the first conductive film and the first insulating film;

(c) forming a third insulating film over the semiconductor substrate including sidewalls and an upper part of the cap insulating film;

(d) forming a fourth insulating film over the third insulating film;

(e) forming a first hole part by etching the fourth insulating film;

(f) etching the third insulating film exposed in a bottom of the first hole part by a predetermined amount after the step (e);

(g) forming a fifth insulating film having a film thickness not fully burying a space between the plurality of the gate electrodes over the fourth insulating film and sidewalls and the bottom of the first hole part; and

(h) forming a second hole part by applying anisotropic

etching to the fifth insulating film.

2. The method of producing the semiconductor integrated circuit device according to claim 1, wherein an amount of the third insulating film etched in the step (f) is equal to or above a film thickness of the fifth insulating film formed in the step (g) and equal to or under a film thickness of the third insulating film.

3. The method of producing the semiconductor integrated circuit device according to claim 1, wherein the step of removing the fifth insulating film over the fourth insulating film and in the bottom of the first hole part and removing the third insulating film underlying the bottom of the first hole part in the step (h) is performed by etchback.

4. The method of producing the semiconductor integrated circuit device according to claim 1, wherein the third insulating film is etched by anisotropic etching in the step (f).

5. The method of producing the semiconductor integrated circuit device according to claim 1, wherein the first insulating film is comprised of an insulating film having a main component of silicon nitride, the third insulating film is comprised of an insulating film having a main component of silicon nitride, the fourth insulating film is comprised of an insulating film having a main component of silicon oxide and the fifth insulating film is comprised of an insulating

film having a main component of silicon nitride.

6. The method of producing the semiconductor integrated circuit device according to claim 5, wherein etching in the step (e) is performed by dry etching using an etching gas containing a fluorocarbon-based gas, a diluent gas and a gas having oxygen.

7. The method of producing the semiconductor integrated circuit device according to claim 6, wherein the etching gas is formed at a composition ratio where the fluorocarbon-based gas is greater than the gas having oxygen and the third insulating film is etched so as to form the first hole part into a forward tapered shape narrowing from top to bottom.

8. The method of producing the semiconductor integrated circuit device according to claim 5, wherein etching in the step (f) is performed by dry etching using an etching gas containing a fluorocarbon-based gas, a diluent gas and a gas having oxygen.

9. The method of producing the semiconductor integrated circuit device according to claim 8, wherein the etching gas is formed at a composition ratio where the fluorocarbon-based gas is greater than the gas having oxygen and the third insulating film is etched so as to form the first hole part into a forward tapered shape narrowing from top to bottom.

10. A method of producing a semiconductor integrated circuit device comprising the steps of:

(a) forming a first conductive film over a semiconductor substrate and then forming a first insulating film over the first conductive film;

(b) forming a plurality of gate electrodes and a cap insulating film covering an upper part of the gate electrodes by etching the first conductive film and the first insulating film;

(c) forming a second insulating film by oxidizing sidewalls of the plurality of gate electrodes and a surface of the semiconductor substrate between the plurality of gate electrodes;

(d) forming a third insulating film over the semiconductor substrate including an upper part of the second insulating film and an upper part and sidewalls of the cap insulating film;

(e) forming a fourth insulating film over the third insulating film;

(f) forming a first hole part by etching the fourth insulating film;

(g) etching the third insulating film exposed in a bottom of the first hole part using the second insulating film as an etching stopper after the step (f);

(h) forming a fifth insulating film having a film thickness not fully burying a space between the plurality of gate electrodes over the fourth insulating film and sidewalls

and the bottom of the first hole part;

(i) applying anisotropic etching to the fifth insulating film to expose the second insulating film; and

(j) forming a second hole part by removing the second insulating film exposed from the fifth insulating film.

11. The method of producing the semiconductor integrated circuit device according to claim 10, wherein the step of removing the fifth insulating film over the fourth insulating film and the bottom of the first hole part and removing the second insulating film underlying the bottom of the first hole part in the step (i) is performed by etchback.

12. The method of producing the semiconductor integrated circuit device according to claim 10, wherein the third insulating film is etched by anisotropic etching in the step (g).

13. The method of producing the semiconductor integrated circuit device according to claim 10, wherein the first insulating film is comprised of an insulating film having a main component of silicon nitride, the second insulating film is comprised of an insulating film having a main component of silicon oxide, the third insulating film is comprised of an insulating film having a main component of silicon nitride, the fourth insulating film is comprised of an insulating film having a main component of silicon oxide and the fifth insulating film is comprised of an insulating film having a

main component of silicon nitride.

14. The method of producing the semiconductor integrated circuit device according to claim 13, wherein etching in the step (f) is performed by dry etching using an etching gas containing a fluorocarbon-based gas, a diluent gas and a gas having oxygen.

15. The method of producing the semiconductor integrated circuit device according to claim 14, wherein the etching gas is formed at a composition ratio where the fluorocarbon-based gas is greater than the gas having oxygen and the third insulating film is etched so as to form the first hole part into a forward tapered shape narrowing from top to bottom.

16. The method of producing the semiconductor integrated circuit device according to claim 13, wherein etching in the step (g) is performed by dry etching using an etching gas containing a fluorocarbon-based gas, a diluent gas and a gas having oxygen.

17. The method of producing the semiconductor integrated circuit device according to claim 16, wherein the etching gas is formed at a composition ratio where the fluorocarbon-based gas is greater than the gas having oxygen and the third insulating film is etched so as to form the first hole part into a forward tapered shape narrowing from top to bottom.

18. A method of producing a semiconductor integrated circuit device comprising the steps of:

(a) forming a first conductive film over a semiconductor substrate and then forming a first insulating film over the first conductive film;

(b) forming a plurality of gate electrodes and a cap insulating film covering an upper part of the gate electrodes by etching the first conductive film and the first insulating film;

(c) forming a third insulating film over the semiconductor substrate including an upper part and sidewalls of the cap insulating film;

(d) forming a fourth insulating film over the third insulating film;

(e) forming a first hole part by etching the fourth insulating film;

(f) etching the third insulating film exposed in a bottom of the first hole part by a predetermined amount after the step (e);

(g) forming a fifth insulating film having a film thickness not fully burying a space between the plurality of the gate electrodes over the fourth insulating film and sidewalls and the bottom of the first hole part;

(h) forming a second hole part by applying anisotropic etching to the fifth insulating film; and

(i) forming a second conductive film inside the second hole part,

wherein the third insulating film is overlapped with the fifth insulating film in the bottom of the second hole part.

19. The method of producing the semiconductor integrated circuit device according to claim 18, wherein the semiconductor substrate is cleaned before the step (i).

20. The method of producing the semiconductor integrated circuit device according to claim 18, wherein the fifth insulating film is formed to have a film thickness thinner than that of the third insulating film.

21. The method of producing the semiconductor integrated circuit device according to claim 19, wherein the fourth insulating film is an organic-based insulating film.

22. The method of producing the semiconductor integrated circuit device according to claim 21, wherein the fourth insulating film is an organic SOG film.

23. The method of producing the semiconductor integrated circuit device according to claim 19, wherein the fourth insulating film is an inorganic-based insulating film.

24. The method of producing the semiconductor integrated circuit device according to claim 23, wherein the fourth insulating film is an inorganic SOG film.

25. The method of producing the semiconductor integrated circuit device according to claim 19, wherein the

fourth insulating film is an insulating film having a dielectric constant of about four or under.

26. The method of producing the semiconductor integrated circuit device according to claim 19, wherein a plan shape of an opening of the second hole part is formed to be circular, oval or rectangular.

27. The method of producing the semiconductor integrated circuit device according to claim 26, wherein a ratio of a length of a long side to a short side of the opening of the second hole part is about from one to three.

28. The method of producing the semiconductor integrated circuit device according to claim 26 or 27, wherein a ratio of a depth to the long side of the opening of the second hole part is about one or greater.

29. A method of producing a semiconductor integrated circuit device comprising the steps of:

(a) forming a first conductive film over a semiconductor substrate and then forming a first insulating film over the first conductive film;

(b) forming a plurality of gate electrodes and a cap insulating film covering an upper part of the gate electrodes by etching the first conductive film and the first insulating film;

(c) forming a second insulating film by oxidizing sidewalls of the plurality of gate electrodes and a surface

of the semiconductor substrate between the plurality of gate electrodes;

(d) forming a third insulating film over the semiconductor substrate including an upper part of the second insulating film and an upper part and sidewalls of the cap insulating film;

(e) forming a fourth insulating film over the third insulating film;

(f) forming a first hole part by etching the fourth insulating film;

(g) etching the third insulating film exposed in a bottom of the first hole part using the second insulating film as an etching stopper after the step (f);

(h) forming a fifth insulating film having a film thickness not fully burying a space between the plurality of gate electrodes over the fourth insulating film and sidewalls and the bottom of the first hole part;

(i) applying anisotropic etching to the fifth insulating film to expose the second insulating film;

(j) forming a second hole part by removing the second insulating film exposed from the fifth insulating film; and

(k) forming a second conductive film inside the second hole part,

wherein the third insulating film is overlapped with the fifth insulating film in a bottom of the second hole part.

30. The method of producing the semiconductor integrated circuit device according to claim 29, wherein the semiconductor substrate is cleaned before the step (k).

31. The method of producing the semiconductor integrated circuit device according to claim 29, wherein the fifth insulating film is formed to have a film thickness thicker than that of the third insulating film.

32. The method of producing the semiconductor integrated circuit device according to claim 30, wherein the fourth insulating film is an organic-based insulating film.

33. The method of producing the semiconductor integrated circuit device according to claim 32, wherein the fourth insulating film is an organic SOG film.

34. The method of producing the semiconductor integrated circuit device according to claim 30, wherein the fourth insulating film is an inorganic-based insulating film.

35. The method of producing the semiconductor integrated circuit device according to claim 34, wherein the fourth insulating film is an inorganic SOG film.

36. The method of producing the semiconductor integrated circuit device according to claim 30, wherein the fourth insulating film is an insulating film having a dielectric constant of about four or under.

37. The method of producing the semiconductor integrated circuit device according to claim 30, wherein a plan

shape of an opening of the second hole part is formed to be circular, oval or rectangular.

38. The method of producing the semiconductor integrated circuit device according to claim 37, wherein a ratio of a length of a long side to a short side of the opening of the second hole part is about from one to three.

39. The method of producing the semiconductor integrated circuit device according to claim 37 or 38, wherein a ratio of a depth to the long side of the opening of the second hole part is about one or greater.

40. A semiconductor integrated circuit device comprising:

a plurality of gate electrodes formed over a semiconductor substrate;

a cap insulating film formed over the plurality of gate electrodes;

a hole part formed between the plurality of gate electrodes, the hole part reaching the semiconductor substrate;

one insulating film configuring at least a part of sidewalls of the cap insulating film, sidewalls of the gate electrodes and sidewalls of the hole part;

another insulating film formed over said one insulating film;

a further insulating film configuring sidewalls of said hole part; and

a conductive film formed inside said hole part,

wherein said one insulating film is overlapped with said further insulating film in a bottom of said hole part.

41. The semiconductor integrated circuit device according to claim 40, wherein a film thickness of said

further insulating film is a film thickness not fully burying a space between the plurality of the gate electrodes.

42. The semiconductor integrated circuit device according to claim 40, wherein said one insulating film has a film thickness thickening from top to bottom inside said hole part, and said hole part is a forward tapered shape narrowing from top to bottom.

43. The semiconductor integrated circuit device according to claim 40, wherein said one insulating film and said further insulating film each has a main component of silicon nitride.

44. The semiconductor integrated circuit device according to claim 40, wherein said one insulating film has a main component of silicon nitride and said further insulating film has a main component of silicon oxide.

45. The semiconductor integrated circuit device according to claim 40, wherein said further insulating film has a film thickness thinner than that of said one insulating film.

46. The semiconductor integrated circuit device according to claim 40, wherein said further insulating film has a film thickness thicker than that of said one insulating film.

47. The semiconductor integrated circuit device according to claim 40, wherein said another insulating film is an organic-based insulating film.

48. The semiconductor integrated circuit device according to claim 47, wherein said another insulating film is an organic SOG film.

49. The semiconductor integrated circuit device according to claim 40, wherein said another insulating film is an inorganic-based insulating film.

50. The semiconductor integrated circuit device according to claim 49, wherein said another insulating film is an inorganic SOG film.

51. The semiconductor integrated circuit device according to claim 40, wherein said another insulating film is

an insulating film having a dielectric constant of about four or less.

52. The semiconductor integrated circuit device according to claim 40, wherein a plan shape of an opening of said hole part is formed to be circular, oval or rectangular.

53. The semiconductor integrated circuit device according to claim 52, wherein a ratio of a length of a long side to a short side of the opening of said hole part is about from one to three.

54. The semiconductor integrated circuit device according to claim 52, wherein a ratio of a depth to the long side of the opening of said hole part is about one or greater.

55. The semiconductor integrated circuit device according to claim 53, wherein a ratio of a depth to the long side of the opening of said hole part is about one or greater.

56. A semiconductor integrated circuit device comprising:

memory cells of a dynamic random access memory, including gate electrodes formed over a main surface of a

semiconductor substrate;

one insulating film covering upper surfaces of said gate electrodes, side surfaces of said gate electrodes and said main surface;

another insulating film formed over said one insulating film to cover said one insulating film;

a hole part formed in said another insulating film and in said one insulating film such that said one insulating film configures side walls of said gate electrodes and side walls of said hole part, said hole part reaching said substrate;

a further insulating film configuring side walls of said hole part such that said further insulating film is overlapped with said one insulating film in entire circumference of a bottom of said hole part,

wherein said one insulating film contains silicon and nitrogen,

wherein said further insulating film contains silicon and nitrogen, and

a conductive film is formed inside said second hole part.

57. A semiconductor integrated circuit device according to claim 56, wherein said another insulating film contains a

spin on glass (SOG) film.

58. A semiconductor integrated circuit device according to claim 56, wherein said further insulating film has a thickness thinner than that of said one insulating film.

59. A semiconductor integrated circuit device according to claim 56, wherein said gate electrodes include gate electrodes of transfer MISFETs of memory cells of said dynamic random access memory.

60. A semiconductor integrated circuit device according to claim 56, wherein said another insulating film has a dielectric constant less than four.

61. A semiconductor integrated circuit device comprising:

gate electrodes formed over a main surface of a semiconductor substrate;

one insulating film covering upper surfaces of said gate electrodes, side surfaces of said gate electrodes and said main surface;

another insulating film formed over said one insulating film to cover said one insulating film;

a hole part formed in said another insulating film and in said one insulating film such that said one insulating film configures side walls of said gate electrodes and side walls of said hole part, said hole part reaching said substrate;

a further insulating film configuring side walls of said hole part such that said further insulating film is overlapped with said one insulating film in entire circumference of a bottom of said hole part,

wherein said one insulating film contains silicon and nitrogen,

wherein said further insulating film contains silicon and nitrogen, and

a conductive film is formed inside said hole part.

62. A semiconductor integrated circuit device according to claim 61, wherein said another insulating film contains a spin on glass (SOG) film.

63. A semiconductor integrated circuit device according to claim 61, wherein said further insulating film has a thickness thinner than that of said one insulating film.

64. A semiconductor integrated circuit device comprising:

memory cells of a dynamic random access memory, each including a gate electrode of a transfer MISFET formed over a main surface of a semiconductor substrate;

one insulating film covering upper surfaces of said gate electrodes, side surfaces of said gate electrodes and said main surface;

another insulating film formed over said one insulating film to cover said one insulating film;

a hole part formed in said another insulating film and in said one insulating film such that said one insulating film configures side walls of said gate electrodes and side walls of said hole part, said hole part reaching said substrate;

a further insulating film configuring side walls of said hole part such that said further insulating film is overlapped with said one insulating film in entire circumference of a bottom of said hole part,

wherein said one insulating film contains silicon and nitrogen,

wherein said further insulating film contains silicon and nitrogen;

wherein a conductive film is formed inside said hole part, and

wherein said another insulating film contains a spin on

glass (SOG) film.

65. A semiconductor integrated circuit device according to claim 64, wherein said further insulating film has a thickness thinner than that of said one insulating film.